

**CURRICULUM VITAE**Name: **Rajiv R. Ratan**

Date of preparation: 03/16/2010

**A. GENERAL INFORMATION**

Office address: The Burke Medical Research Institute  
 785 Mamaroneck Avenue  
 White Plains, NY 10605

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 Scarsdale, NY 10583

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Citizenship: US Citizen

**B. EDUCATIONAL BACKGROUND**

<i>Degree</i>	<i>Institution name, city and state</i>	<i>Dates attended</i>	<i>Year Awarded</i>
B.A.	Amherst College	1977	1981
M.D.	NY University School of Medicine	1981	1988
Ph.D.	NY University School of Medicine (Pharmacology)	1981	1988

**PROFESSIONAL POSITIONS AND EMPLOYMENT****Post-doctoral training including residency/fellowship**

<i>Title</i>	<i>Institution name, city and state</i>	<i>Dates</i>
Intern in Medicine	The University of Chicago Hospitals and Clinics, Chicago	1988-89
Resident in Neurology	The John Hopkins Hospital, Baltimore	1988-91
Chief Resident	The Johns Hopkins Hospital, Baltimore	1991-92
Fellow in Neurorehabilitation	Depts. of Neuroscience and Rehabilitation Medicine, The John Hopkins University School of Medicine	1992-94

**Academic positions (teaching and research)**

<i>Title</i>	<i>Institution name, city and state</i>	<i>Dates</i>
Assistant Professor in Physical Medicine and Rehabilitation and Neurology	The Johns Hopkins University School of Medicine	1994-1996
Assistant Professor in Neurology	Harvard Medical School	1996-2000
Associate Professor in Neurology	Harvard Medical School	2000-2004
Burke Professor of Neurology and Neuroscience	Weill Medical College of Cornell University	2004-present

**Hospital positions (attending physician, if applicable)**

<i>Title</i>	<i>Institution name, city and state</i>	<i>Dates</i>
Attending Staff, Departments of Rehabilitation Medicine and Neurology	The Johns Hopkins Hospital, Baltimore	1994-1996
Attending Staff	The Good Samaritan Hospital, Baltimore	1994-1996
Attending Neurologist	The Beth Israel-Deaconess Medical Center, Boston	1996-
Consultant in Neurorehabilitation	Youville Hospital, Cambridge, Mass.	1996-
Chair, Institutional Review Board	Burke Rehabilitation Hospital	2004 -

**Employment (other than positions listed above)**

<i>Title</i>	<i>Institution name, city and state</i>	<i>Dates</i>
Executive Director	Burke/Cornell Medical Research Institute	02/03-present

**LICENSURE, BOARD CERTIFICATION, MALPRACTICE (if applicable)**

**Licensure**

<i>State</i>	<i>Number</i>	<i>Date of Issue</i>	<i>Date of last registration</i>
Maryland	N/A	1992	1996
Massachusetts	150018	07/23/1996	2003
New York	To be submitted		

DEA number: BR4954485

**Board Certification**

<i>Name of specialty</i>	<i>Board Certificate #</i>	<i>Date of Certification</i>
Neurology	41972	1995

**Malpractice insurance**

Do you have Malpractice insurance? Yes

Name of Provider: CRICO

Premiums paid by: (self/ group/ institution (give name of group/institution)  
Institution (BIDMC)

**E. PROFESSIONAL MEMBERSHIPS (*medical and scientific societies*)**

<i>Member/officer</i>	<i>Name of Organization</i>	<i>Dates held</i>
Member	Sigma Xi	1981-
Member	American Academy of Neurology	1989
Member	Society for Neuroscience	1993-
Member	American Society for Experimental Therapeutics	2002-
Member	NY Academy of Sciences	2003-

**F. HONORS AND AWARDS**

<i>Name of award</i>	<i>Date awarded</i>
NIH-Medical Scientist Training Program Fellow	1983-88
Alpha Omega Alpha	1988
The Jay Slotkin Award for Excellence in Research, Dept of Neurology, the John Hopkins Hospital	1992
Passano Foundation Clinician Scientist Award	1994
ISN "Hot Paper" Recognition for manuscript entitled, "Oxidative Stress- induces Apoptosis in Embryonic Cortical Neurons"	1995

**G. INSTITUTIONAL/HOSPITAL AFFILIATION**

Primary Hospital Affiliation: Burke Rehabilitation Hospital

Other Hospital Affiliations:

Other Institutional Affiliations:

**H. EMPLOYMENT STATUS**

Name of Employer(s): Burke Rehabilitation Hospital

Employment Status (*select from below*) :

Full-time salaried by Cornell

Full-time salaried at Cornell-affiliated hospital

Part-time salaried at Cornell

Part-time salaried at Cornell-affiliated hospital

Voluntary (self-employed or member of a P.C.)

Other non-salaried

**CURRENT AND PAST INSTITUTIONAL RESPONSIBILITIES AND PERCENT EFFORT**

Teaching ( <i>list courses and your role</i> )	Dates
<b>1. Local Contributions</b>	
The Johns Hopkins University School of Medicine Neurology Clerkship Lecture Series 20-25 medical students; 4 hours/year	1992-1996
Rehabilitation Residents and Faculty "Pathophysiology of Neurological Disease" 10-15 faculty and residents; 80 hours/year	1992-1994
Rehabilitation Resident's Lecture Series "Neurologic Examination of the Rehabilitation Patient", "Pathophysiology of Peripheral Nerve Disease" "Evaluation and Treatment of Stroke"; 10-15 residents	1992-1996
Clinical Neuroscience Seminar Series "Oxidative death in neurons: murder or Suicide?"	1992
Rehabilitation Medicine Grand Rounds "The role of antioxidants in the recovery of function after neural injury"	1994
Rehabilitation Medicine Grand Rounds	1995

Teaching continued

- Quarter Course Instructor, Course Title: 1998(Nov-Dec)  
"Transcriptional regulation of survival and death in neurons"  
Division of General Medical Sciences, Harvard Medical School  
8 graduate students met 2 h/week for 8 weeks. Out of class  
preparation was 8 h/week
- Tutorial Instructor, Alternate Pathway, Human Neurobiology 2000 (Aug-Oct)  
and Behavior, 8 medical students met 5-6 hrs/week for 8 weeks. Out  
of class preparation was 5-6 h/week.
- Tutorial Instructor, Alternate Pathway, Human Nervous System and 2001 (Aug-Oct)  
Behavior Course, 8 medical students met 5-6 hours/week for 8 weeks.  
Out of class preparation was 5-6 h/week.

### **Advising Responsibilities**

#### Post-Doctoral Fellows

Khalequz Zaman, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center,  
Harvard Medical School (10/96-6/2000)

Amin Habib, M.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard  
Medical School (7/97- 6/98)

Sukalyan Chatterjee, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center,  
Harvard Medical School (8/97- 8/98)

Kuo-I Lin, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard  
Medical School (2/98-9/98)

Adriana Conforto, M.D., Department of Neurology, Beth Israel Deaconess Medical Center,  
Harvard Medical School (10/98-12/98)

Hoon Ryu, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard  
Medical School (3/99-present)

Bin Du, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard  
Medical School (8/99-7/00)

Farzaneh Sorond, M.D., Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center,  
Harvard Medical School (7/99- 7/00)

Junghee Lee, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard  
Medical School (9/99-present)

Ambreena Siddiq, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center,  
Harvard Medical School (10/01-10/09)

Jingwei Sheng, M.D., Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School (10/01-)

Leila Aminova, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School (10/01-)

Issam Ayoub, M.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School (03/02-)

Brett Langley, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School (10/02-)

Peiyuan Lu, Ph.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School (02/03-)

Chien-Jung Lu, M.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School (01/01/03-12/31/03)

Phillip Lange, M.D., Department of Neurology, Beth Israel Deaconess Medical Center, Harvard Medical School (02/04-2007)

Juan Chavez, Ph.D., Burke/Cornell Medical Research Institute (12/03-12/07)

JoAnn Gensert Ph.D., Burke/Cornell Medical Research Institute (3/04-12/07)

Renee Haskew-Layton Ph.D., Burke/Cornell Medical Research Institute (07/05-)

Ksenia Karpisheva, Ph.D., Burke/Cornell Medical Research Institute (12/07-10/09)

Kasturi Banerjee, Burke/Cornell Medical Research Institute (01/08-04/09)

Sama Sleiman, Burke/Cornell Medical Research Institute (01/08-)

Lata Mahishi, Burke/Cornell Medical Research Institute (02/08-)

Henchang Guo, Burke/Cornell Medical Research Institute (03/08-)

Zoya Nietskaya, Burke/Cornell Medical Research Institute (8/07-2009)

Manuela Basso, Burke/Cornell Medical Research Institute (01/09-)

Saravanan Karuppagounder, Burke/Cornell Medical Research Institute (2009-)

Thong Ma, Burke/Cornell Medical Research Institute (04/08-)

Hossein Aleyasin, Burke/Cornell Medical Research Institute (11/09-)

### Graduate Student Advisor:

Kuo-I Lin, successfully completed requirements for a Ph.D. degree from Johns Hopkins (2/09/98)

Kevin O'Donovan-rotation student, Department of Neuroscience, Johns Hopkins (07/93-10/93)

Andrew Doan-rotation student, Department of Neuroscience, Johns Hopkins (06/94-09/94)

Reecha Sofat-rotation student, Department of Neurology, Beth Israel Deaconess Medical Center/Harvard (10/97-12/97)

Luis Castellanos, Pre-Matriculation Program at Harvard Medical School, (6/99-8/99)

Stephen McConoughey, Neuroscience Graduate Program, Weill Medical College of Cornell University (6/04- expected date 12/08)

Rachel Speer, Neuroscience Graduate Program, Weill Medical College of Cornell University (10/08)

Amy Strayer, Neuroscience Graduate Program, Weill Medical College of Cornell University (01/10)

### Undergraduate Student Advisor

Paul Lee, Department of Neuroscience, Johns Hopkins (06/95-09/95)

Sapan Shah, Department of Neurology, BIDMC, Harvard Medical School Summer, 1997,1998,1999.

Matt Miller, Department of Neurology, BIDMC, Harvard Medical School, Completed Harvard Undergraduate Honors Thesis, 6/98-6/99.

Kristin Nielson, Department of Neurology, BIDMC, Harvard Medical School (6/99-6/00)  
Completed Harvard Undergraduate Honors Thesis, 6/99-6/00

Young Song, Department of Neurology, BIDMC, Harvard Medical School (6/99-8/99)

Brian Ko, Burke/Cornell Medical Research Institute, Weill Medical College of Cornell University (7/05-9/05)

Zachary Mesner (7/07-9/07) Burke/Cornell Medical Research Institute, Weill Medical College of Cornell University

### **Clinical Care**

Member, Neurorehabilitation Outpatient Clinic, Good Samaritan Hospital  
Baltimore, Maryland (1 day/week)

### **Dates**

1994-1996

1994-1996

Attending Physician, Johns Hopkins Rehabilitation Consultation and In-Patient Service, Good Samaritan Hospital (1 day/week)

Attending Neurologist, Beth Israel Deaconess Medical Center, Boston, MA. (1 month/year)	1996-2003  1998-2003
Attending, Neurorehabilitation Consultation Service, Beth Israel Deaconess Medical Center, Boston, Mass. (1 day/week)	2000-2003
Attending, Neurorehabilitation Clinic, Behavioral Neurology Unit , Beth Israel Deaconess Medical Center, Boston, Mass. (1/2 day/week)	
<b>Administrative duties (including committees)</b>	<b>Dates</b>
Medical Staff Conference Committee	1995-1996
Core A Task Force, Harvard Center for Neurodegeneration and Repair	2002-2004
Neurology Residency Selection Committee, Harvard-BIDMC Neurology Program	1996-2003
Executive Director, Burke Medical Research Institute	2003-present
Board of Directors, Burke Rehabilitation Hospital	2003 current
Member, Institutional Review Board, Burke Rehabilitation Hospital	2004-current
Chairman, Institutional Review Board, Burke Rehabilitation Hospital	2004-current
Principal Investigator, New York State Department of Health Center for Research Excellence in Spinal Cord Injury	2004-current
Burke Foundation Board	2004-current
Burke Developmental Committee	2006-present
Scientific Advisory Board, Center for Stroke Recovery, Ottawa, Canada	2005-present
Program Committee, Society for Neuroscience	2006-present
Program Committee Chair, Recovery Section, AHA International Stroke Meeting	2004-2006

## Research

Nervous system diseases are among the leading causes of handicaps in non-institutionalized people in the United States. Traditional goals of neurorehabilitation have focused on decreasing handicaps of patients by improving function at the level of disability. However, responsible rehabilitation begins by promoting preventative measures. Among the preventative measures that might improve recovery after nervous system injuries such as stroke includes pharmacological prevention of delayed cell death. Several converging lines of inquiry suggest that free radicals may be important mediators of primary and secondary neuronal injury and consequent disability in acute and chronic neurodegenerative states. However, antioxidants have been disappointing as neurological therapeutics. These limitations derive, in part, from inadequate understanding of markers of oxidative stress in neurons, mechanisms of defense against oxidants; how these endogenous mechanisms of defense can be augmented to therapeutic advantage

## Dates

07/92-present



and the role of free radicals in normal cell function. We have used the experimental leverage of an in vitro model of neuronal oxidative stress to demonstrate: a) that free radicals can inappropriately unleash a protein synthesis-dependent suicide death pathway in neurons. b.) to identify transcription factors such as NF- $\kappa$ B and hypoxia-inducible factor-1, which are targets for antioxidants in abrogating cell death; and c.) to purify a contaminating and multipotent anti-apoptotic activity from a bovine liver catalase preparation and to identify it as arginase. These studies have identified novel strategies for limiting neuronal apoptosis and potential markers for antioxidant treatment in the central nervous system.

In accomplishing these research goals, I have participated in training undergraduates, graduate students and post-doctoral fellows. I have also taught a seminar course at Harvard Medical School on the "Transcriptional regulation of survival and death in neurons". The course attempts, by using distinct transcription factors as case studies, to outline how transcription factors may regulate homeostatic responses and how small molecules that emulate these transcriptional responses might be useful in decreasing disability associated with neurological disease.

The overall goal of these research and teaching activities is to impact at the hospital bedside, neurological disability by developing small molecules that prevent neuronal death. In keeping with these goals I have been participating in the evaluation and care of patients on the neurology ward who are in need of rehabilitation.

### **C. Report of Current Research Activities**

<b>Project # 1:</b> Neuroprotective gene induction by antioxidant iron chelators. <b>Role:</b> P.I.	1993-present
<b>Project #2:</b> The role of arginase in cell survival, translation and regeneration in the CNS. <b>Role:</b> P.I.	1997-present
<b>Project #3:</b> Transcriptional modulation by mithramycin and histone deacetylase inhibitors prevents oxidative stress-induced death. <b>Role:</b> P.I.	1998-present
<b>Project #4:</b> The role of hypoxia-inducible factor-1 in hypoxic-ischemic injury in the central nervous system. <b>Role:</b> P.I.	1995-present
<b>Project #5:</b> A novel in vitro model of hydrogen peroxide-induced survival. <b>Role:</b> P.I.	2001-present

<b>Project #6:</b> Sp1 and Sp3 are oxidative stress-inducible, Antideath proteins in cortical neurons	2001-present
<b>Project #7:</b> NF-kappa B and the regulation of cell death	1993-1999
<b>Project #8:</b> Transglutaminase acts as a repressor of transcription in Huntington's disease	2004-present
<b>Project #9:</b> ATF4 is an oxidative stress-inducible, prodeath transcription factor in neurons in vitro and in vivo.	2006-present

*Check if activity involves WMC*

Current percent effort	%	students	researchers
<u>Percent effort</u>			
Teaching	10		
Clinical Care	0		
Administration	60		
Research	30		
Total	100%		

**J. RESEARCH SUPPORT (past and present)**

Source	Amount	Date	Name of Principal Investigator
NIH(MSTP Fellowship), NYU		1983-1987 1992-1994	Michael Shelanski Arthur Siebens
NIH (Neurorehab Fellow)		1994-1996	Rajiv Ratan, 80% effort
Passano Foundation		1996-1997	Rajiv Ratan, 10% effort
William Randolph Hearst Fund: HIF-1 and neuroprotection			
NIH (RO1) Redox regulation of neuronal apoptosis		1995-1999  1997-2002	Jay Baraban/Rajiv Ratan 40% effort  Rajiv Ratan 75% effort
NIH (KO8) Mechanisms of pathological neuronal apoptosis		1997-2002	Rajiv Ratan 75% effort
NIH (R29) Novel strategies to limit neuronal apoptosis		1999-2003	Rajiv Ratan 20% effort
NIH (RO1)		2000-2003	Marla Berry, Ratan (Co-

Neuroprotective gene induction by antioxidant iron chelators		PI) 5% effort
NIH (R01) Selenoprotein P and the nervous system	2001-2005	Rajiv Ratan, 20% effort
NIH (R01) Arginase and the regulation of nitric oxide synthase	2002-2007	Rajiv Ratan, 20% effort
NIH (P01) Project #2, Transcriptional mechanisms of oxidative death	2002-2009	Marie Filbin, Rajiv Ratan, 5% effort
NIH (R01-Javitz Award) Arginase and the regulation of neuronal regeneration	2002-2004	Rajiv Ratan/Michael Schlossmacher, 5% effort
Harvard Center for Neurodegeneration and Repair-Translational grant-Transcriptional regulation of Parkin by ER stress	2004-2009	Rajiv R. Ratan (30% effort), Mark Noble, Marie Filbin
New York State Department of Health-Spinal Cord Injury Research Center of Excellence (CO)19772)	2004-2010	Rajiv Ratan (5% effort)
NIH (PO1 AG14930-09) Project #1 Mitochondrial Dysfunction in Neurogeneration of Aging	2005-2010	Rajiv Ratan
Adelson Program in Neurorehabilitation and Repair	2007-2009	Rajiv Ratan
The Dana Foundation 08121738	2008-2011	Rajiv Ratan
Thomas Hartman Foundation for Parkinson's Research, Inc.	2009-2011	Rajiv Ratan

NIH (PO1 AG14930-10)  
Project #1 Mitochondrial  
Dysfunction in  
Neurodegeneration of  
Aging

2010-2011

Rajiv Ratan

## K. EXTRAMURAL PROFESSIONAL RESPONSIBILITIES

Alleghen Singer Research Institute Intramural Funding Program, Ad hoc reviewer	1994-1995
Parkinson's disease Society of the United Kingdom, Ad hoc reviewer	1995
ALS Association Grant Review Committee	1995-1997
NIH "Special Emphasis Panel" Post doctoral grant review committee, Bethesda	1996
Co-Chair, Scientific Symposium on "Apoptosis" American Academy of Neurology, San Francisco, California.	1997
NIH Neurology Study Section "A", Ad hoc reviewer	1998-2004
Department of Defense Study Section, Virginia	1999
NIH Molecular Cellular and Developmental Neuroscience Study Section	2000
(Neurodegeneration and the Biology of Glia) Permanent Member	2000
NCI Site Visit Review Committee, New York University	
American Heart Association, Brain/Stroke Study Section, Dallas, Texas	2001
American Heart Association Bugher Award Study Section, Dallas, Texas	2001
National Institutes of Health, Special Emphasis Panel, "Mitochondria and Neurodegeneration"	2002
Advisory Board, Redox Cell Biology and Genetics ( a volume of Methods in Enzymology)	2002-present
American Heart Association, Brain/Stroke Study Section, Dallas, Texas	2002-present
American Heart Association, Bugher Stroke Award Study Section	2002
Site Visit Review Committee, 03/02-Iron and Restless Legs Syndrome, Johns Hopkins University, Baltimore, Maryland	2002
Scientific Advisory Board, Forseti Biotechnology	
Scientific Advisory Board, Boston Cure Project	2000-present
Scientific Advisory Board, Fibrogen, Inc.	2001-present
Scientific Advisory Board, Gliamed, Inc.	2004-
NIH Special Emphasis Panel. Effects of hypoglycemia on neurons and glia.	1994-present
NIH Special Emphasis Panel. High throughput screening for novel neurological therapeutics.	
Editorial Board, Antioxidants and Redox Signaling	
Editorial Board, NeuroRx	2004
Editorial Board, Journal of Neuroscience	
Ad hoc reviewer, Science, Nature Medicine, Nature Cell Biology, Proceedings of the National Academy of Science, NeuroRx, Journal of Neuroscience, Journal of Neurochemistry, Neuroscience, European Journal of Biochemistry, Molecular Medicine, Annals of Neurology, Journal of Comparative Neurology, Journal of Neurobiology	2006-2006-2005-
External Reviewer, Ph.D. Thesis, David Levinthal (Don DeFranco advisor) University of Pittsburgh	2006-
Editorial Board, Stroke	2006-2009
Editorial Board, Neurobiology of Disease	2007-
Scientific Advisory Board, Ottawa/Toronto Virtual Center for Stroke Recovery	
Program Committee, Society for Neuroscience-Annual Meeting	2006-2009
Reviewing Editor, Journal of Neuroscience	2006-
(For three additional years until 2012)	

Co-organizer, New York Academy of Science Meeting on  
 "Oxidative Stress And Mitochondrial Dysfunction in the CNS"-  
 A meeting honoring Dr. John Blass 2007-  
 Founding member, Adelson Program in Neurorehabilitation and  
 Neural Repair 2006-  
 Executive Council, Adelson Program in Neurorehabilitation and Repair 2007-  
 Program Committee, Society for Neuroscience 2007-  
 Editorial Board, Translational Stroke Research 2009-  
 Editorial Board, Journal of Cerebral Blood Flow and Metabolism 2009-  
 Advisory Board of the CMUH Clinical Trial Center of Excellence (CTCE) 2009-  
 Attended Scientific Advisory Board, Johnson & Johnson 2009  
 Editorial Board, International Journal of Clinical & Experimental Medicine 2010-  
 Category Chair, Basic and Translational Neuroscience of Stroke Recovery 2010-  
 and Multidisciplinary Clinical Rehabilitation  
 Stroke Clinical Trials Scientific Advisory Board, China Medical University 2010  
 Taipei, Taiwan

## L. BIBLIOGRAPHY

Peer Reviewed Articles

### Original Reports

1. Ellison G and **Ratan, R.R.** (1982) The late stage following continuous amphetamine administration in rats is correlated with altered dopamine but not serotonin metabolism. *Life Sciences* 31:771-777.
2. Shay, T., Radee, A.L. & **Ratan, R.R.** (1984) Unstable angina pectoris after myocardial infarction. *IMJ III Med J* 166, 27-30.
3. Keith, C.H., **Ratan, R.R.**, Maxfield, F.R., Bajer, A. & Shelanski, M.L. (1985) Local cytoplasmic calcium gradients in living mitotic cells. *Nature* 316, 848-850.
4. Peterson, C., **Ratan, R.R.**, Shelanski, M.L. & Goldman, J.E. (1986) Cytosolic free calcium and cell spreading decrease in fibroblasts from aged and Alzheimer donors. *Proc Natl Acad Sci U S A* 83, 7999-8001.
5. Keith, C.H., Bajer, A.S., **Ratan, R.**, Maxfield, F.R. & Shelanski, M.L. (1986) Calcium and calmodulin in the regulation of the microtubular cytoskeleton. *Ann N Y Acad Sci* 466, 375-391.
6. **Ratan, R.R.**, Shelanski, M.L. & Maxfield, F.R. (1986) Transition from metaphase to anaphase is accompanied by local changes in cytoplasmic free calcium in Pt K2 kidney epithelial cells. *Proc Natl Acad Sci U S A* 83, 5136-5140.
7. Shelanski, M. & **Ratan, R.** (1987) The use of microinjection and video microscopy for the study of calmodulin and calcium in living cells. *Methods Enzymol* 139, 824-834.
8. Peterson, C., **Ratan, R.R.**, Shelanski, M.L. & Goldman, J.E. (1988) Altered response of fibroblasts from aged and Alzheimer donors to drugs that elevate cytosolic free calcium. *Neurobiol Aging* 9, 261-266.
9. **Ratan, R.R.**, Maxfield, F.R. & Shelanski, M.L. (1988) Long-lasting and rapid calcium changes during mitosis. *J Cell Biol* 107, 993-999.
10. Peterson, C., **Ratan, R.**, Shelanski, M. & Goldman, J. (1989) Changes in calcium homeostasis during aging and Alzheimer's disease. *Ann N Y Acad Sci* 568, 262-270.
11. **Ratan, R.R.**, Murphy, T.H. & Baraban, J.M. (1994) Macromolecular synthesis inhibitors prevent oxidative stress-induced apoptosis in embryonic cortical neurons by shunting cysteine from protein synthesis to glutathione. *J Neurosci* 14, 4385-4392.
12. **Ratan, R.R.**, Murphy, T.H. & Baraban, J.M. (1994) Oxidative stress induces apoptosis in embryonic cortical neurons. *J Neurochem* 62, 376-379.
13. Savitz, J.M., Young, M.A. & **Ratan, R.R.** (1994) Basilar artery occlusion in a young

- patient with Wegener's granulomatosis. *Stroke* 25, 214-216.
14. Lin, K.I., Lee SH, Narayanan R, Baraban JM, Hardwick JM, **Ratan, R.R.** (1995) Thiol agents and Bcl-2 identify an alphavirus-induced apoptotic pathway that requires activation of the transcription factor NF-kappa B. *J Cell Biol* 131, 1149-1161.
  15. **Ratan, R.R.** & Baraban, J.M. (1995) Apoptotic death in an in vitro model of neuronal oxidative stress. *Clin Exp Pharmacol Physiol* 22, 309-310.
  16. **Ratan, R.R.**, Lee, P.J. & Baraban, J.M. (1996) Serum deprivation inhibits glutathione depletion-induced death in embryonic cortical neurons: evidence against oxidative stress as a final common mediator of neuronal apoptosis. *Neurochem Int* 29, 153-157.
  17. Togashi, H., Sasaki, M., Frohman, E., Taira, E., **Ratan, R.R.**, Dawson, T.M., Dawson, V.L. (1997) Neuronal (type I) nitric oxide synthase regulates nuclear factor kappaB activity and immunologic (type II) nitric oxide synthase expression. *Proc Natl Acad Sci U S A* 94, 2676-2680.
  18. Esch, F., Lin, K.I., Hills, A., Zaman, K., Baraban, J.M., Chatterjee, S., Rubin, L., Ash, D.E., **Ratan, R.R.** (1998) Purification of a multipotent antideath activity from bovine liver and its identification as arginase: nitric oxide-independent inhibition of neuronal apoptosis. *J Neurosci* 18, 4083-4095 (1998).
  19. Habib, A.A., Hognason, T., Ren, J., Stefansson, K. & **Ratan, R.R.** (1998) The epidermal growth factor receptor associates with and recruits phosphatidylinositol 3-kinase to the platelet-derived growth factor beta receptor. *J Biol Chem* 273, 6885-6891.
  20. Lin, K.I., Baraban, J.M. & **Ratan, R.R.** (1998) Inhibition versus induction of apoptosis by proteasome inhibitors depends on concentration. *Cell Death Differ* 5, 577-583.
  21. Lin, K.I., Chattopadhyay, N., Bai, M., Alvarez, R., Dang, C.V., Baraban, J.M., Brown, E.M., **Ratan, R.R.** (1998) Elevated extracellular calcium can prevent apoptosis via the calcium-sensing receptor. *Biochem Biophys Res Commun* 249, 325-331.
  22. Lin, K.I., DiDonato, J.A., Hoffmann, A., Hardwick, J.M. & **Ratan, R.R.** (1998) Suppression of steady-state, but not stimulus-induced NF-kappaB activity inhibits alphavirus-induced apoptosis. *J Cell Biol* 141, 1479-1487.
  23. Lin, K.I., Pasinelli, P., Brown, R.H., Hardwick, J.M. & **Ratan, R.R.** (1999) Decreased intracellular superoxide levels activate Sindbis virus-induced apoptosis. *J Biol Chem* 274, 13650-13655.
  24. Nargi, J.L., **Ratan, R.R.** & Griffin, D.E. (1999) p53-independent inhibition of proliferation and p21(WAF1/Cip1)-modulated induction of cell death by the antioxidants Nacetylcysteine and vitamin E. *Neoplasia* 1, 544-556.
  25. Zaman, K., Ryu, H., Hall, D., O'Donovan, K., Lin, K.I., Miller, M.P., Marquis, J.C., Baraban, J.M., Semenza, G.L., **Ratan, R.R.** (1999) Protection from oxidative stress-induced apoptosis in cortical neuronal cultures by iron chelators is associated with enhanced DNA binding of hypoxia-inducible factor-1 and ATF-1/CREB and increased expression of glycolytic enzymes, p21(waf1/cip1), and erythropoietin. *J Neurosci* 19, 9821-9830.
  26. Sorond, F.A. & **Ratan, R.R.** (2000) Ironing-out mechanisms of neuronal injury under hypoxic-ischemic conditions and potential role of iron chelators as neuroprotective agents. *Antioxid Redox Signal* 2, 421-436.
  27. Chatterjee, S., Zaman, K., Ryu, H., Conforto, A. & **Ratan, R.R.** (2001) Sequence selective DNA binding drugs mithramycin A and chromomycin A3 are potent inhibitors of neuronal apoptosis induced by oxidative stress and DNA damage in cortical neurons. *Ann Neurol* 49, 345-354.
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- nuclear factor-kappa B (NF-kappa B)-inducing kinase to activate NF-kappa B. Identification of a novel receptor-tyrosine kinase signalosome. *J Biol Chem* 276, 8865-8874.
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  82. McConoughey, S.J., Niatetskaya, Z.V., Pasternack, R., Hils, M., **Ratan R.R.** and Cooper, a.J. (2009) A nonradioactive dot blot assay for transglutaminase activity, *Anal Biochem* 390,91-93.
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  84. **Ratan, R.R.**, and Noble, M. (2009) Novel multi-modal strategies to promote brain and spinal cord injury recovery, *Stroke* 40, S130-132.
  85. Riveccio, M.A., Brochier, C., Willis, D.E., Walker, B.A., D'Annibale, M.A., McLaughlin, K., Siddiq, A., Kozikowski, A.P., Jeffrey, S.R., Twiss, J.L. **Ratan, R.R.**, And Langley, B. (2009) HDAC6 is a target for protection and regeneration following injury in the nervous system, *Proc Natl Acad Sci U S A* 106,19599-19604.
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  87. Sleiman, S.F., Basso, M., Mahishi, L., Kozikowski, A.P., Donohoe, M.E. Langley, B., **Ratan, R.R.** (2009) Putting the "HAT" back on survival signaling: the promises and challenges of HDAC inhibition in the treatment of neurological conditions. *Expert Opin Invest Drugs* 18, 573-584.

88. Gibson, G.E., Starkov, A., Blass, J.P., **Ratan, R.R.**, & Beal, M.F. (2009) Cause and consequence: Mitochondrial dysfunction initiates and propagates neuronal dysfunction, neuronal death and behavioral abnormalities in age-associated neurodegenerative diseases. *Biochim Biophys Acta* 1802, 122-134.
89. Ma, Thong C., Campana, Aline, Lange, Phiipp S., Lee, Hsin-Hwa, Banerjee, Kasturi, Bryson, J. Barney, Mahishi, Lata, Alam, Shabnam, Giger, Roman J., Barnes, Stephen, Morris Jr, Sidney M., Willis, Dianna E., Twiss, Jeffrey L., Filbin, Marie T., **Ratan, Rajiv R.** (2010) A Large-Scale Chemical Screen for Regulators of the Arginase 1 Promoter Identifies the Soy Isoflavone Daidzein as a Clinically Approved Small Molecule That Can Promote Neuronal Protection or Regeneration via a cAMP-Independent Pathway. *J Neurosci* 30, 739-748.
90. Niatetskaya, Z., Basso, M., Speer, R.E., McConoughey, S.J., Coppola, G., Ma, T.C., and **Ratan, R.R.** (2010) HIF prolyl hydroxylase inhibitors prevent neuronal death induced by mitochondrial toxins: therapeutic implications for Huntington's disease and Alzheimer's disease, *Antioxid Redox Signal* 12, 435-443.
91. Akiba, Y., Cave, J.W., Akiba, N., Langley, B., **Ratan, R.R.**, and Baker, H. (2010) Histone deacetylase inhibitors de-repress tyrosine hydroxylase expression in the olfactory bulb and rostral migratory stream, *Biochem Biophys Res Commun*.

### Proceedings of Meetings

1. Keith, C.H., Bajer, A.S., **Ratan, R.R.**, Maxfield, F.R., Shelanski, M.L. (1986) Calcium and calmodulin and the regulation of the microtubular cytoskeleton. *Ann. N.Y.Acad. Sci.*, 486:375-391.
2. Peterson, C., **Ratan, R.**, Shelanski, M.L. and Goldman, J. (1989) Changes in calcium homeostasis during aging and Alzheimer's Disease. *Ann. N.Y. Acad. Sci.* 568:262-270.
3. **Ratan, R.R.**, Baraban, J.M. (1995) Apoptotic death in an in vitro model of neuronal oxidative stress. *Clinical and Experimental Pharmacology and Physiology*. 22(4): 309-310.
4. Sorond, F. and **Ratan, R.R.** (2000) Ironing out hypoxic-ischemic injury in the central nervous system: iron chelators as multivalent neuroprotectants. *Antioxidants and redox signaling. Antioxidants and Redox Signaling* 3(1):44-66.
5. **Ratan, R.R.** (2009) Harnessing hypoxic adaptation to prevent ischemic neuronal death. *New York Academy of Sciences*, in press.

### Reviews and Educationally Relevant Publications

1. **Ratan, R.R.** Of worms and humans: caspase inhibitors as novel neuroprotectants. *Journal Watch Neurology*. 1(4): pp:26-27.
2. **Ratan, R.R.** Pathogenesis of neurodegenerative disorders. edited by Mark Mattson. *Annal. Neurol.* May, 2002.
3. **Ratan, R.R.** & Speer, R. E. (2009) Drug treatment for neurodegenerative disorders among the elderly: re-engaging homeostatic programs. *Aging Health* 5 (2), 133-136.
4. Sleiman, S.F., Basso, M., Mahishi, L., Kozikowski, A.P., Donohoe, M.E., Langley, B., **Ratan, R.R.** (2009) Putting the "HAT" back on survival signaling: the promises and challenges of HDAC inhibitors in neurological therapeutics. *Expert Opin Investig Drugs*. 18, 573-584.

## Chapters

1. **Ratan, R.R.**, Shelanski, M.L. Calcium and the Regulation of mitotic events. Trends in Biochem. Sci. 1986; 11:456-459.
2. Shelanski, M.L., **Ratan R.R.** The use of microinjection and video microscopy for the study of calmodulin an calcium in living cells. Methods in Enzymology 1987; 139:824-834.
3. **Ratan, R.R.** Neurological Evaluation of the Rehabilitation Patient. In: Young, M.H., O, Young, B., and Steins, S. eds. Rehabilitation Secrets. Philadelphia: Haley and Belfus. pp. 99-106.
4. Zaman, K. and **Ratan, R.R.** Glutathione and the Regulation of Apoptosis in the Nervous System. In: Shaw, C.A. Ed. Glutathione in the Nervous System. Washington, D.C.: Taylor and Francis. pp 117-136.
5. **Ratan, R.R.** Cell Death and the Mitochondrial Encephalomyopathies. In: Koliatsos, V.E. and Ratan, R.R. Eds. Cell Death and Diseases of the Nervous System. Totawa: Humana. pp. 275-294.
6. **Ratan, R.R.** Antioxidants and the Treatment of Neurological Disease. In: Koliatsos, V.E. and Ratan, R.R. Eds. Cell Death and Diseases of the Nervous System. Totawa: Humans. pp.634-649
7. Volpe, B.T. and **R.R. Ratan.** (2007) Clinical and Neurobiological Aspects of Stroke Recovery. Gliman S. Ed. Neurobiology of Disease. San Diego: Elsvier. pp. 241-255.
8. Haskew-Layton, R. and **Ratan.R.R.** (2009) The Janus Faces of Hypoxia-Sensitive Transcription Factors in Promoting Cell Survival or Death in the Central Nervous System. Kaur, J. ed. In press.
9. **Rajiv R. Ratan**, Moses Chao (2009) Cell Death in Spinal Cord Injury: An Evolving Taxonomy with Therapeutic Promise. In press.
10. **Rajiv R. Ratan** (2009) Oxidative damage in neurodegeneration and injury. Section III: Mechanisms, Chapter 14. Handbook of the Neuroscience of Aging. In press.

## Books

1. Cell Death and Diseases of the Nervous System, V.E. Koliatsos and **R. R. Ratan**, Eds. Totawa; Humana. 1999
2. Current Atherosclerosis Reports (Cardiovascular disease and stroke) John Blass and **Raj Ratan**, Section Editors. Vol 6(4): 2004.
3. Mitochondria and Oxidative Stress in Neurodegenerative Disorders, Gary E. Gibson, **Rajiv R. Ratan**, M. Flint Beal. Annals of the New York Academy of Sciences. Vol 1147: 2008.

## Presentations

### Invited Speaker:

- 1994 In Vitro Toxicology Meeting, Montreal, Canada (Inv. lect.)  
1994 American Institute on Aging Symposium, Washington, D.C. (Inv. lect.)  
1994 NIH/DRG Workshop-"Role of Antioxidants and Free Radicals in Neurobiology and Disease, Hollywood Florida (Inv. lect.)
- 1995 Eisai London Research Laboratories, London, England (Inv. lect.)  
1995 Department of Neurology, Beth Israel Hospital, Boston (Inv. lect.)  
1995 Department of Neurology, Washington University, St. Louis (Inv. lect.)

1995 National Institute of Neurological Disorders and Stroke, Stroke Branch (Inv.lect.)  
Bethesda, Maryland

1995 Department of Pathology, Columbia University, New York (Inv. lect.)

1996 Department of Physiology, University of Medicine and Dentistry of New Jersey at Newark, Newark, New Jersey (Inv. lect.)

1996 Department of Biochemistry, Mount Sinai School of Medicine, New York (Inv. lect.)

1996 Tularik, San Francisco, California (Inv. lect.)

1996 Eisai London Research Labs, London, England (2 Inv. lect.)

1996 National Heart Lung and Blood Institute, Biochemistry Branch, Bethesda, Maryland (Inv. lect.)

1996 Department of Pharmacology, University of Rochester, Rochester, New York (Inv. lect.)

1997 Mitokor, Sorrento Valley, California (Inv. lect.)

1997 Longwood Neurology Grand Rounds, Boston (Inv lect.)

1998 Department of Biology, Massachusetts Institute of Technology, Boston (Inv. lect.)

1998 Division on Aging, Harvard Medical School, Boston, Mass. (Inv. lect.)

1998 Department of Neurology, Beth Israel-Deaconess Medical Center, Boston (Inv. lect.)

1998 Department of Pharmacology and Toxicology, The University of Kansas, Kansas City, Missouri (Inv. lect.)

1999 North Carolina Medical Schools' "Cell Death in Health and Disease Symposia", Wake Forest University School of Medicine, Winston-Salem, North Carolina (Symposium)

1999 National Institutes of Aging Workshop- "Antioxidant Nutrients in Aging" (Symposium) Holiday Inn Chevy Chase, Bethesda, Maryland

1999 Department of Neurobiology, University of Texas at Galveston Medical Branch (Inv. lect.)

2000 Pfizer Pharmaceuticals, Groton, Connecticut (Inv. lect.)

2000 Department of Neurology, The University of Texas at Houston (Inv. lect.)

2000 International Meeting of the Oxygen Society of California, Ventura California (Plenary Presentation)

2000 Bio2000, Boston, Mass. (Inv. Lect.)

2000 International Meeting on Molecular Aspects of Neurodegeneration, Tobago, West Indies (Symposium)

2000 National Institutes of Health, National Institutes of Neurological Diseases and Stroke (Inv. lect.)

2000 Department of Neurobiology, Harvard Medical School (Inv. Lect.)

2001 Neuronyx, Inc., Malvern, PA (Inv. Lect.)

2001 Boston Cell Death Club, Boston, Mass. (Inv. Lect.)

2001 Department of Biology, Hunter College of the City University of New York (Inv. Lect.)

2001 Department of Neuroscience, Georgetown University School of Medicine (Inv. Lect.)

2001 Children's Research Institute, D.C. Children's Hospital (Inv. Lect.)

2001 New York Friends of Myelin, New York, New York  
 2001 Department of Molecular Medicine, Ohio State University School of Medicine (Inv. Lect.)  
 2001 The Buck Institute for Aging, Novato, California (Inv. Lect.)  
 2001 Plenary Speaker, Biology of Noise-Induced Hearing Loss, Seattle, Washington  
  
 2002 Department of Neuroscience, The University of Connecticut, Farmington, Conn. (Inv. Lect.)  
 2002 School of Pharmacy, University of Rhode Island, Kingston, Rhode, Island (Inv. Lect.)  
 2002 Princeton Stroke Conference, Coronado, California  
 2002 Neuroscience Research Institute, University of Ottawa, Ottawa, Canada (Inv. Lect.)  
 2002 Department of Neuroscience, University of Pittsburgh, Pittsburgh, PA (Inv. Lect.)  
 2002 STAIR Conference, Cambridge, Massachusetts  
 2002 Fibrogen, Inc. South San Francisco, California  
 2002 International Symposium on Regeneration and the Brain, Abano Terme, Italy (Symposium Lecture)  
 2002 Symposium Speaker at the American Society for Neurochemistry Meeting, Palm Beach, Florida. Iron and Copper and Neurodegeneration  
 2002 Speaker for HDF Meeting, Cambridge, Mass.  
 2002 Department of Neuroscience, Penn State Hershey Medical Center (Inv. Lect.)  
 2002 Department of Biochemistry, Drexel University School of Medicine (Inv. Lect.)  
 2002 Department of Molecular and Cellular Biology, University of Texas at Dallas (Inv. Lect.)  
 2002 Department of Neurology, Massachusetts General Hospital (Inv. Lect.)  
 2002 Department of Neurology, Beth Israel Deaconess Medical Center (Inv. Lect.)  
 2002 Kennedy-Krieger Institute, Johns Hopkins University School of Medicine  
 2002 The Miami Project to Cure Paralysis (Inv. Lect.)  
 2002 The Dean's Hour Lecture, Cornell University Medical College (Inv. Lect.)  
 2002 International Symposium on Regeneration and the Brain, Okazaki, Japan  
  
 2003 Dept of Neurology, Emory University School of Medicine (Inv. Lect.)  
 2003 Acorda Therapeutics (Inv. Lect.)  
  
 2004 Princeton Stroke Conference, Baltimore, Maryland (Symposium Lecture)  
 2004 International Symposium on Arginine, Hamilton, Bermuda (Symposium Lecture)  
 2004 Department of Neurology, Weill Medical College of Cornell (Inv. Lect.)  
 2004 Burke Medical Research Institute, Weill Medical College of Cornell  
 2004 Symposium on stem cells and childhood disorders, Tarrytown, New York  
 2004 Department of Neurology, University of Texas at Southwestern (Inv. Lect.)  
  
 2005 Department of Molecular Biology, University of Texas at Dallas (Inv. Lect.)  
 2005 Department of Pharmacology, Emory University School of Medicine (Inv. Lect.)  
 2005 Department of Neurology and Neuroscience, Vanderbilt School of Medicine  
  
 2006 Vanderbilt Stroke Symposium, Nashville, Tennessee (Symposium Lect.)  
 2006 Symposium honoring Dr. Michael Shelanski, Columbia College of Physicians and Surgeons  
 2006 Grand Rounds, Neurology, Weill Medical College of Cornell  
 2006 Adelson Program in Neurorehabilitation and Repair, Las Vegas Nevada

- 2006 Keck Center for Collaborative Neuroscience, Rutgers, New Jersey
- 2006 Chaim Mayman Lecture, Department of Neurology, Harvard Medical School
- 2007 Grand Rounds, Neurology, Johns Hopkins University School of Medicine
- 2007 A Symposium Honoring John Blass, New York Academy of Sciences.
- 2007 Hallym-New York Presbyterian Symposium on Neurodegenerative Disorders, New York Academy of Sciences.
- 2008 New York State Spinal Cord Injury Research, New York Academy of Sciences
- 2008 Neurotrain Conference, Innsbruck, Austria (Inv. Lect.)
- 2008 Nebraska Redox Biology Center, Fifth Annual Symposium on Redox Physiology In Health and Disease (Inv. Lect)
- 2009 American Heart Association, International Stroke Conference 2009, Plenary talk, San Diego, CA
- 2009 The University of Miami Miller School of Medicine, The Miami Project to Cure Paralysis, Miami, FL. (Inv. Lect)
- 2009 The University of British Columbia, Brain Research Conference Centre, Vancouver, BC, (Inv. Lect)
- 2009 Grand Rounds, Albert Einstein School of Medicine
- 2009 Fall Symposium, Thomas Hartman Foundation on Parkinson's Research
- 2009 The First International Conference on Metal Chelation in Biology & Medicine, Bath, UK
- 2010 Basic Biology and Medicine Series, Loma Linda University, CA
- 2010 International Stroke Conference 2010, San Antonio Convention Center, San Antonio, TX

Signature: \_\_\_\_\_ Date: \_\_\_\_\_